

LA-UR-21-27054

Approved for public release; distribution is unlimited.

Title: Modified ENDF/B-V Y-89 Cross Sections for MCNP

Author(s): Little, Robert Currier

Intended for: Report

Issued: 2021-07-21

Disclaimer:

Los Alamos National Laboratory, an affirmative action/equal opportunity employer, is operated by Triad National Security, LLC for the National Nuclear Security Administration of U.S. Department of Energy under contract 89233218CNA000001. By approving this article, the publisher recognizes that the U.S. Government retains nonexclusive, royalty-free license to publish or reproduce the published form of this contribution, or to allow others to do so, for U.S. Government purposes. Los Alamos National Laboratory requests that the publisher identify this article as work performed under the auspices of the U.S. Department of Energy. Los Alamos National Laboratory strongly supports academic freedom and a researcher's right to publish; as an institution, however, the Laboratory does not endorse the viewpoint of a publication or guarantee its technical correctness.

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: Distribution

DATE: September 6, 1985

FROM: R. C. Little, X-6 RCL

MAIL STOP/TELEPHONE: B226/7-4886

SYMBOL: X-6:RCL-85-443

SUBJECT: MODIFIED ENDF/B-V Y-89 CROSS SECTIONS FOR MCNP

Reference 1 describes the processing of two sets of ^{89}Y cross sections for use in MCNP calculations; one from ENDL85, the other from ENDF/B-V. A disagreement of a factor of two in the total cross section below 1 keV was noted. Since that time, the ENDF/B-V evaluator (Bob Schenter) has suggested a modification to his data that greatly improves the agreement between the two sets of total cross sections.

Following Schenter's suggestion, we have changed the scattering radius from 5.3849×10^{-13} cm to 7.6×10^{-13} cm. We then reprocessed the evaluation through the RECONR, BROADR, HEATR, and ACER modules of NJOY. Results for the total cross section are shown in Fig. 1. The data labelled ORIGINAL and MODIFIED are the two ENDF/B-V curves. The increase in total cross section below 1 keV is evident; it is less obvious from Fig. 1 that the modified total cross section is larger than the original total cross section up to 20 keV. The modified ENDF/B-V total cross section is in good agreement with the data from ENDL85 (ZAID=39089.35C). The elastic scattering cross sections are shown in Fig. 2 for original and modified ENDF/B-V. Schenter has indicated that a complete re-evaluation of ^{89}Y cross sections is likely for ENDF/B-VI.

The ENDF/B-V ^{89}Y ACE-format cross sections have been replaced with the modified results. The ZAID remains 39089.50C. The data may be used in MCNP as described in Ref. 1. Note that heating numbers are available in this data set.

Reference

1. R. C. Little, "Y-89 Cross Sections for MCNP," Los Alamos National Laboratory memorandum X-6:RCL-85-419 to Distribution (August 16, 1985).

September 6, 1985

Distribution

L. L. Carter, HEDL
R. E. Schenter, HEDL
R. J. Howerton, L-298, LLNL
R. E. MacFarlane, T-2, MS B243
R. A. Forster, X-6, MS B226
H. M. Fisher, X-6, MS B226
J. S. Hendricks, X-6, MS B226
R. E. Seamon, X-6, MS B226
E. C. Snow, X-6, MS B226
R. C. Little, X-6, MS B226
X-6 Files (2)

September 6, 1985

09/05/85

Y-89

MT=1

TOTAL

ZAID = 39089.50C
From File ORIGINAL

ZAID = 39089.50C
From File MODIFIED

ZAID = 39089.35C
From File ND85Y893

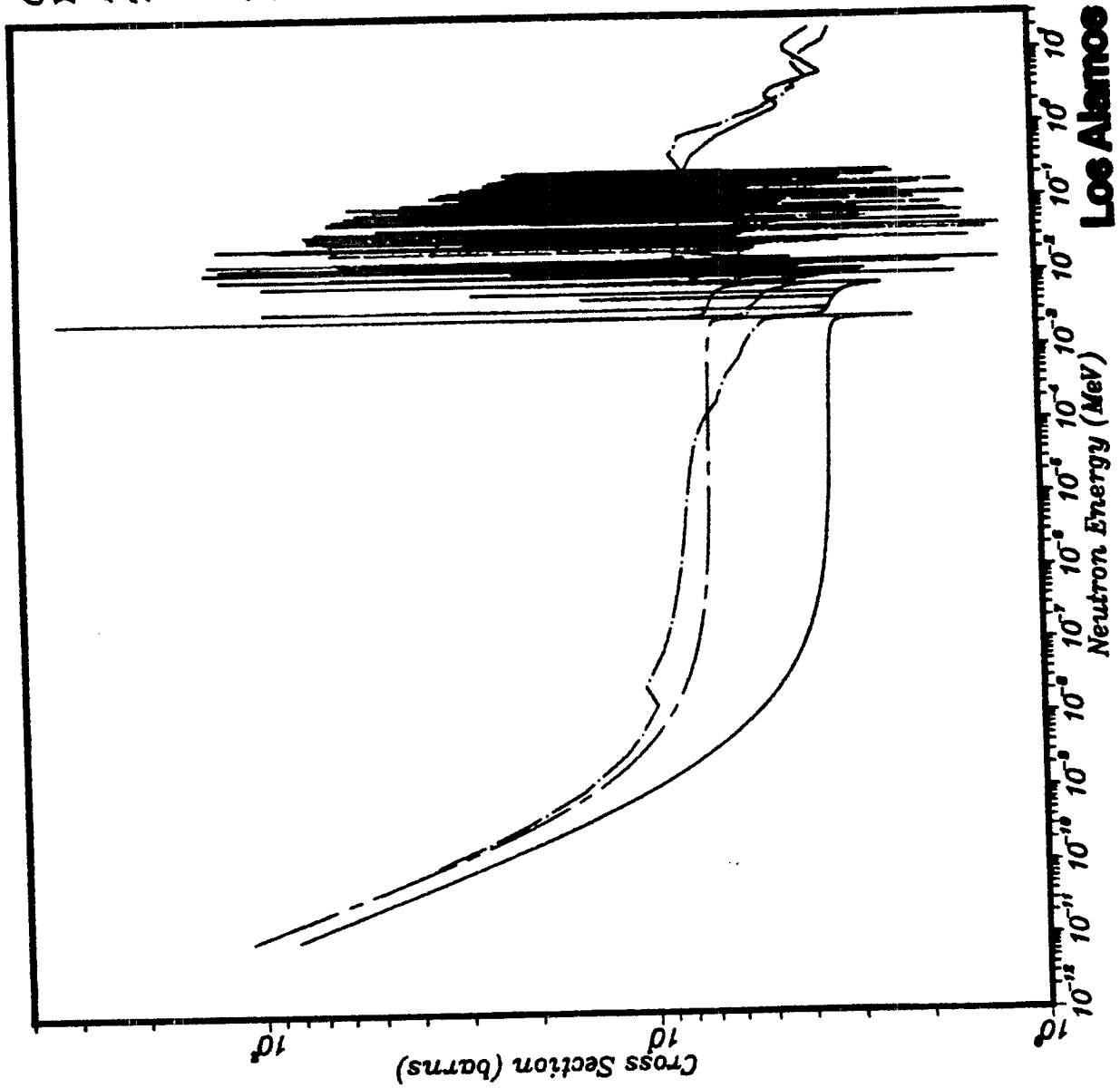


Figure 1

09/05/85

Y-89

MT=2

ELASTIC

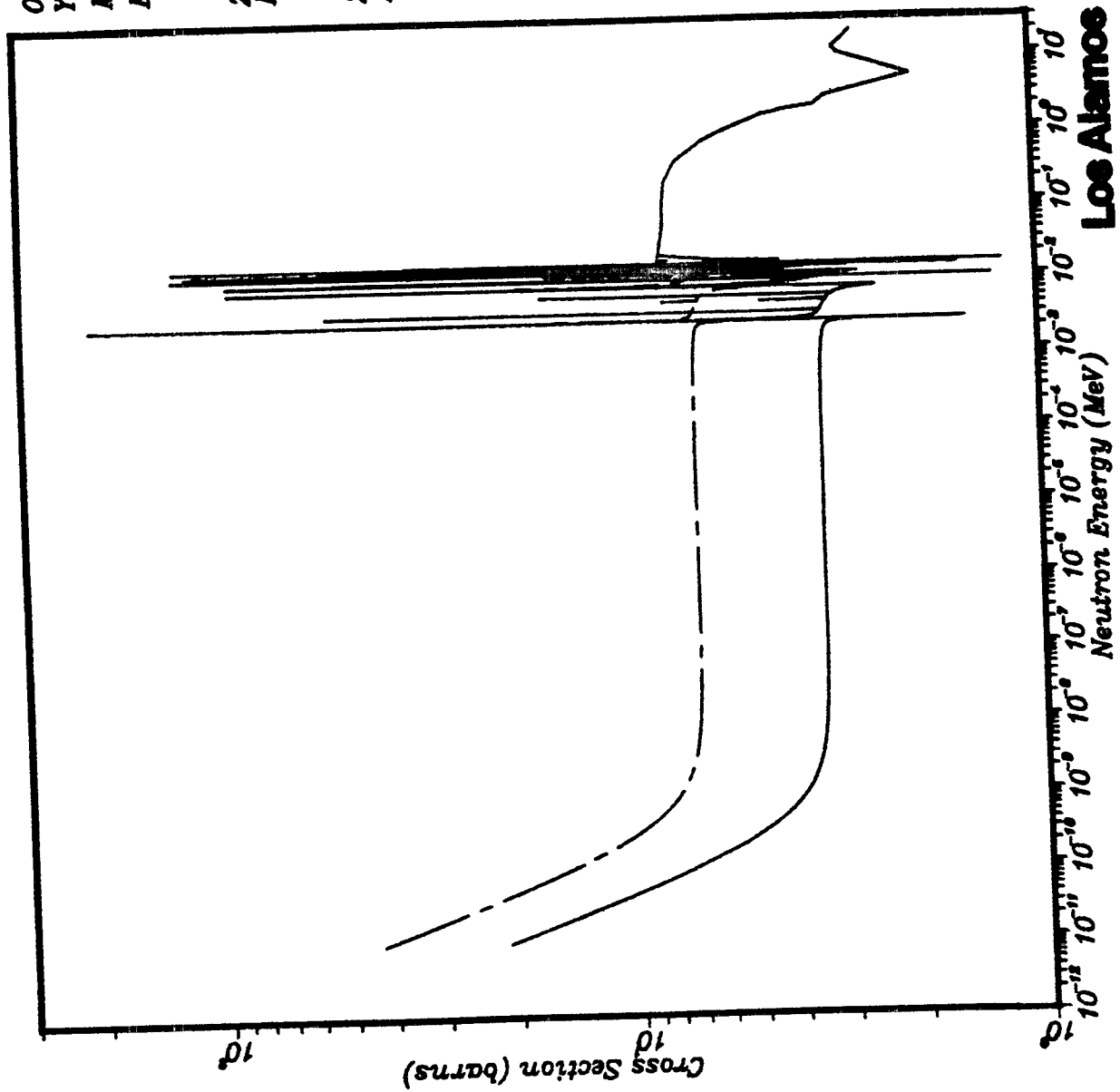
ZAID = 39089.50C
From File ORIGINALZAID = 39089.50C
From File MODIFIED

Figure 2